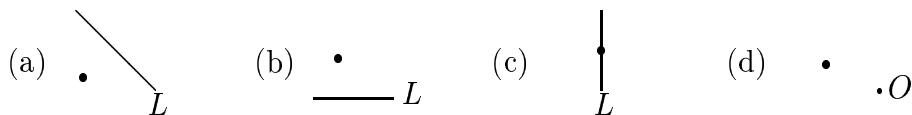


Reflection and Symmetry Problems

Math 130 Kovitz

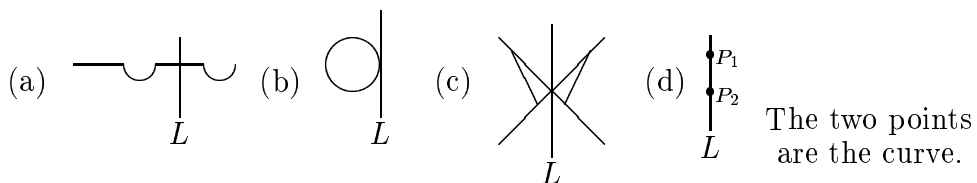
1. Draw the reflected point across L or through O .



2. Draw the reflected curve across the line L or through the point O .



3. Indicate whether the curve is symmetric across L . (yes or no)



4. Indicate whether the curve is symmetric through O .



TURN OVER

5. Let P be the point $(2, 3)$.
- (a) Find its reflection
 - i. across the line $y = x$.
 - ii. through the origin.
 - (b) Plot the two answers, labeling each point with its coordinates and with the name of the reflection of P that led to that point.
6. (a) Graph $y = \frac{1}{x^2}$.
- (b) Find an equation of the reflection of that graph across the x -axis.
7. Find and prove one symmetry of the curve $x + y = 8$.
8. What symmetries apply to the graph of
- (a) $x^2 + y = 5$
 - (b) $x^2 + 6y^8 = 11$
 - (c) $8x^2 + y^2 = -4$
9. Consider the curve defined by the equation

$$x = y^2 + 5$$

- (a) Given that $y = 3$, find a point on the curve.
- (b) List the four new points obtained by the four usual reflections of this point.
- (c) Which of these four points obtained from the four usual reflections are on the graph of the equation?
- (d) What conclusions can you draw about any of the four usual symmetries of the *curve*? *Be careful.*
- (e) Find and prove a symmetry of $x = y^2 + 5$. (Suggestion: use the reflection from equation method—that is, show that the (new) equation of the reflection obtained by the replacement rule for that symmetry is equivalent to the original equation.)